

Amendments to the Claims:

This listing of claims will replace all versions and listings of claims in the application:

Listing of Claims:

1. – 28. (Canceled)

29. (New) A circulating fluidized bed boiler comprising:

a fluidized bed containing solids fluidized by a fluidization gas, and
an oxygen transport membrane being disposed in the fluidized bed, wherein the oxygen transport membrane extracts oxygen from pressurized air provided thereto and provides the oxygen to the fluidized bed.

30. (New) The circulating fluidized bed boiler of claim 1, wherein the fluidization gas is CO₂.

31. (New) The circulating fluidized bed boiler of claim 30, wherein the fluidization gas is recycled CO₂.

32. (New) The circulating fluidized bed boiler of claim 1, further includes a fluid line for providing a combined fluidization gas and oxygen from the fluidized bed to a firebox.

33. (New) The circulating fluidized bed boiler of claim 1, further includes a fluid pressurizing device that pressurizes the air provided to the oxygen transport membrane.

34. (New) The circulating fluidized bed boiler of claim 1, wherein the oxygen transport membrane is supported within the fluidized solids in the fluidized bed.

35. (New) The circulating fluidized bed boiler of claim 1, wherein the oxygen transport membrane is supported above the fluidized solids in the fluidized bed.

36. (New) The circulating fluidized bed boiler of claim 1, wherein the fluidized bed is disposed within a firebox.

37. (New) The circulating fluidized bed boiler of claim 1, wherein the fluidized bed is open to the firebox for receiving descending solids in the firebox.
38. (New) The circulating fluidized bed boiler of claim 1, wherein the fluidized bed extends along a portion of an inner wall of the firebox.
39. (New) The circulating fluidized bed boiler of claim 1, wherein the fluidized bed is external to a firebox.
40. (New) The circulating fluidized bed boiler of claim 1, wherein the oxygen transport membrane produces oxygen depleted air which is provided to a waste heat boiler.
41. (New) The circulating fluidized bed boiler of claim 1, wherein the oxygen transport membrane includes long tubes supported by intermediate plates.
42. (New) The circulating fluidized bed boiler of claim 1, wherein the oxygen transport membrane includes short tubes with intermediate chambers.
43. (New) The circulating fluidized bed boiler of claim 1, wherein the oxygen transport membrane includes concentric tubes, an inner tube of which serves as a support for a tube of outer membrane.
44. (New) The circulating fluidized bed boiler of claim 43, wherein a space is provided between the concentric tubes.
45. (New) The circulating fluidized bed boiler of claim 44, wherein the air flows in counter-current in the space between the tubes.
46. (New) The circulating fluidized bed boiler of claim 1, wherein the oxygen transport membrane is heated to a high temperature.

47. (New) The circulating fluidized bed boiler of claim 1, wherein the oxygen transport membrane comprises a plurality of oxygen transport membranes.

48. (New) The circulating fluidized bed boiler of claim 47, wherein the high temperature is approximately greater than 700 degrees Celsius.

49. (New) A boiler comprising:

- a fire box in which solid fuel is combusted in the presence of oxygen; and
- an oxygen transport membrane being disposed in thermal communication with the firebox to provide sufficient heat for the oxygen transport membrane wherein the oxygen transport membrane extracts oxygen from pressurized air provided thereto and provides the oxygen to the firebox.

50. (New) The boiler of claim 1, further includes a fluid pressurizing device that pressurizes the air provided to the oxygen transport membrane.

51. (New) The boiler of claim 1, wherein the oxygen transport membrane is disposed on the periphery of the lower portion of the firebox.

52. (New) The boiler of claim 1, wherein the oxygen transport membrane is disposed on a hearth of the firebox.

53. (New) The boiler of claim 1, wherein the oxygen transport membrane produces oxygen depleted air which is provided to a waste heat boiler.

54. (New) The boiler of claim 1, wherein the oxygen transport membrane includes long tubes supported by intermediate plates.

55. (New) The boiler of claim 1, wherein the oxygen transport membrane includes short tubes with intermediate chambers.

56. (New) The boiler of claim 1, wherein the oxygen transport membrane includes concentric tubes, an inner tube of which serves as a support for a tube of outer membrane.

57. (New) The boiler of claim 1, wherein the oxygen transport membrane comprises a plurality of oxygen transport membranes.

58. (New) The boiler of claim 1, wherein the oxygen transport membrane is heated to a high temperature.